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XIV. *An Account of a Curious and Singular Appearance of the Aurora Borealis, on the* 27th *of March* 1781, *by* CALEB GANNETT, ESQ. F. A. A.

THE Aurora Borealis is a phenomenon, which, though of great antiquity, if not obſerved by the firſt inhabitants of the earth; yet a ſatisfactory cauſe of it has never been aſſigned. Its region has been generally ſuppoſed that of the clouds. A greater elevation however has by ſome obſervers been ſuggeſted. Could ſufficient data be obtained to aſcertain its height, poſſibly it might be of great uſe in an attempt to inveſtigate the cauſe. Theſe data muſt be expected from repeated and careful obſervations of the aurora, and the ſeveral circumſtances attending it, at different times. With this view is offered the following obſervation of an uncommon, and curious appearance of the aurora in the evening of the 27th of March laſt.

Mr. Mellen, the Philoſophical Tutor in the Univerſity of Cambridge, being abroad in the beginning of the evening, gives the following account; that a duſky vapour, appearing like a cloud, lay extended along the horizon from N. N. W. to N. E. Its upper edge was uneven and changeable. Above it was a body of light, ſtrong and vivid, which emitted ſtreams of a pale colour, but bright, long, and frequent. About half paſt 9 o'clock, there aroſe nearly in the eaſt, a column of ſteady light, inclining conſiderably to the ſouth. From the upper ſide of this column, the light ſoon began to iſſue, not in flaſhes or ſtreaks, but rather in a ſheet like ſmoke driven by the wind. Its direction was towards the zenith; and in a little time, croſſing the meridian, it joined a column of fainter light; which formed in the weſt ſoon after the forementioned column in the eaſt. This ring or zone was at firſt faint, except where it began; but continued to grow brighter, till the ſtars, which were obſervable through it, were much obſcured. At 20 minutes paſt ten, I firſt ſaw it; when its brightneſs began to diminiſh, and its ſituation was as follows. Its eaſtern extremity was very near the eaſt point. The northern limit croſſed the meridian at 20° S. of the zenith. Its weſtern extremity was bounded by Aldebaran, whoſe height was 5°. Its breadth increaſed gradually from the eaſt and weſt limits, to its meridian height, where it was 5° as determined by two ſtars on the Lion's hip, which were near the meridian, and bounded the zone on the north and ſouth. Denel was on the ſouth limit. A ſtar of the ſecond magnitude in the Lion's ſhoulder, was juſt within the northern limit. Vindemiatrix appeared in the middle of the zone, and Pollux, a little without the northern limit. It moved ſlowly towards the ſouth, gradually decreaſed, and diſappeared entirely by 11 o'clock.

In the Tranſactions of the Royal Society in London, is an account of a ſimilar phenomenon, obſerved in Geneva, by Mr. Cramer, in 1730. The zone was terminated by two parallel arches; and was diametrically oppoſite to the middle of the aurora borealis. The aurora and zone ſeemed much nearer one another in the horizon, than in the top. Suppoſing this difference entirely optick, and the paralleliſm of the two circles real, the diſtance of the phenomenon from the earth, he ſays, might be computed. He however cannot admit the ſuppoſition, becauſe the concluſion would be, that the phenomenon would have been diſtant at leaſt $\frac{1}{24}$ of the diameter of the earth, which is too great an altitude to believe. He had previouſly offered a conjecture, reſpecting the production of the zone, viz. from icy particles ſwimming in the air, and of ſuch a figure, as to exhibit a great zone by the reflection and refraction of the light of the aurora, almoſt in the ſame manner as the drops of rain produce the appearance of the rainbow. Whether this hypotheſis, incompatible with the forementioned concluſion, on account of the rarity of the atmoſphere at that height, which renders it incapable of ſuſtaining particles, whoſe ſpecifick gravity ſhould be ſuch as to cauſe the reflections and refractions neceſſary for ſuch a phenomenon, might not bias his judgment, may be queſtioned. He mentions two arches, riſing from the eaſt and ſouth eaſt, meeting in the meridian, immediately afterwards parting, drawing back, and frequently repeating thoſe motions. Theſe arches muſt be ſuppoſed to originate from the ſame cauſe with that of the zone; but whether their motions agree with the cauſe conjectured, every one will judge.

Mr. Profeſſor Greenwood, in an account of an aurora borealis, obſerved by him at Cambridge in 1730, affirms, that this meteor has been obſerved in New-England at different times, ever ſince its firſt plantation; which is contrary to the commonly received opinion, that it is of modern date in this part of the world. Its appearance however, was leſs frequent at the firſt ſettlement, than in the Profeſſor's day. Perhaps, on examination, it will be found, that as the country has been cleared, the frequency of the phenomenon has increaſed. An uniform ratio however is not pretended. Future attention of the curious to this ſubject, will, it is hoped, enable them to give a ſolution of what has generally been ſuppoſed a myſtery; and with which imagination has, in ſome inſtances, played not leſs fantaſtically in the eye of reaſon and philoſophy, than is common for the phenomenon itſelf to do in the view of a ſpectator.

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XV. *Letter on the Darkneſs in Canada, in October*, 1785. *From the Honourable* WILLIAM HEATH, ESQ. F. A. A.

Roxbury, December 30th, 1785.

SIR,

HAVING from the commencement of the American war, to the preſent time, kept a journal of occurrences, and for a number of years paſt, added thereto remarks on the ſeaſons, weather, &c. on obſerving in the publick papers an account of the phenomenon, in the Province of Canada, on the 9th, 15th, and 16th, of October laſt, I was led to examine my journal for the ſtate and appearance of the atmoſphere at this place, on each of the days before mentioned; by which I find, that on the 9th of October, the wind was part of the day ſoutheaſt, and the other part ſouthweſt, the weather fair, cool, and pleaſant; the 15th, wind eaſterly, the atmoſphere foggy. About two o'clock, P. M. it began to grow